SEQUENCE LISTING

<110> Ayyavoo, Velpandi
Patel, Mamata
Kieber-Emmons, Thomas
Weiner, David B.
Mahalingam, Sundaramy

<120> Functional Fragments of HIV-1 VPR Protein and Methods of Using the Same

<130> UPN-4023

<140> 09/435,421
<141> 2000-10-05

<150> 60/055,754
<151> 1997-08-14

<160> 18

<170> PatentIn Ver. 2.1

<210> 1
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 1

Met	Glu	Gln	Ala	Pro	Glu	Asp	Gln	Gly	Pro	Gln	Arg	Glu	Tyr	Pro	Asn
1				5					10					15	
Asp	Trp	Thr	Leu	Glu	Leu	Leu	Glu	Glu	Leu	Lys	Asn	Glu	Ala	Val	Arg
			20					25					30		
His	Phe	Pro	Arg	Ile	Trp	Leu	His	Ser	Leu	Gly	Gln	His	Ile	Tyr	Glu
		35					40					45			
Thr	Tyr	Gly	Asp	Thr	Trp	Thr	Gly	Val	Glu	Ala	Leu	Ile	Arg	Ile	Leu
	50					55					60				
Gln	Gln	Leu	Leu	Phe	Ile	His	Phe	Arg	Ile	Gly	Cys	Arg	His	Ser	Arg
65					70					75					80
Ile	Gly	Ile	Ile	Gln	Gln	Arg	Arg	Thr	Arg	Asn	Gly	Ala	Ser	Lys	Ser
				85					90					95	

<210> 2
<211> 191
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 2
Met Glu Glu Arg Pro Pro Glu Asn Glu Gly Pro Gln Arg Glu Pro Trp
1 5 10 15

Asp Glu Trp Val Val Glu Val Leu Glu Glu Leu Lys Glu Glu Ala Leu
20 25 30

Lys His Phe Asp Pro Arg Leu Leu Thr Ala Leu Gly Asn His Ile Tyr
35 40 45

Asn Arg His Gly Asp Thr Leu Glu Gly Ala Gly Glu Leu Ile Arg Ile
50 55 60

Leu Gln Arg Ala Leu Phe Met His Phe Arg Gly Gly Cys Ile His Ser
65 70 75 80

Arg Ile Gly Gln Pro Gly Gly Gly Asn Pro Leu Ser Ala Ile Pro Pro
85 90 95

Ser Arg Ser Met Leu
100

<210> 3
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 3
Met Thr Asn Pro Arg Glu Thr Ile Pro Pro Gly Asn Ser Gly Glu Glu
1 5 10 15

Thr Ile Glu Glu Ala Phe Asp Trp Leu Asp Arg Thr Val Glu Ala Ile
20 25 30

Asn Arg Glu Ala Val Asn His Leu Pro Arg Glu Leu Ile Phe Gln Val
35 40 45

Trp Gln Arg Ser Trp Arg Tyr Trp His Asp Glu Gln Gly Met Ser Arg
50 55 60

Ser Tyr Thr Lys Tyr Arg Tyr Leu Cys Leu Met Gln Lys Ala Val Phe
65 70 75 80

Met His Phe Lys Lys Gly Cys Thr Cys Arg Gly Glu Gly His Gly Pro
85 90 95

Gly Gly Trp Arg Ser Gly Pro Pro Pro Pro Pro Pro Pro Gly Leu
100 105 110

<210> 4
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 4
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 5
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 5
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Pro Leu Leu Pro Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 6

<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 6
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Ala Glu Ala Ala Glu Glu Ala Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 7
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 7
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ser Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 8
<211> 96

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 8
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Leu Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 9
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 9
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Pro Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 10
<211> 96
<212> PRT

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 10
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ser Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 11
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 11
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Ser Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 12
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 12
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Ser Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 13
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 13
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile Cys Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 14
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 14
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile Tyr Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 15
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 15
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Ala Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 16
<211> 96
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Novel Sequence

<400> 16
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Ser Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95

<210> 17
<211> 78
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 17
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Ile Trp Ile Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Gln Asn Trp Val Ser Thr
65 70 75

<210> 18
<211> 96
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Novel Sequence

<400> 18
Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Tyr Pro Asn

1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg
20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu
35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu
50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg
65 70 75 80

Ile Gly Ile Ile Gln Gln Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser
85 90 95